

tributed. The forty-eight species of land mollusca inhabiting Sokotra are all, so far as known, restricted to the island, and the same is the case with the nine species from Abd-el-Kuri, whilst it appears very doubtful whether the Cyclostomaceous genus *Lithidion*, common to the two islands, ranges beyond the Archipelago. In arachnids, myriopods and insects, a large proportion of the species are peculiar, though not always to the same extent. As regards the relationship of the fauna in general, several of the naturalists direct attention to the presence of Mediterranean types, and in the case of the characteristic arachnids, Mr. R. I. Pocock shows that Mediterranean and Ethiopian elements prevail. Zoologically the Sokotran islands may be placed in the great semi-desert region or sub-region that extends from the Atlantic to the Indus, but there is a considerable admixture in the fauna of Ethiopian representatives.

Geologically the islands consist of the remains of a plateau composed of almost undisturbed Upper Cretaceous and Eocene strata, resting upon granitoid Archæan rocks which protrude through their sedimentary covering in places and form peaks. The most conspicuous of the sedimentary formations are Nummulitic and Alveolina limestones, and "Rudistenkalk" with Radiolites, as in many other parts of the ancient Mediterranean area. According to the British observers, volcanic rocks of the Aden series are intrusive in the limestones.

It is clear, and on this all are agreed, that the Sokotran islands, although separated from Somaliland and Arabia by sea several hundreds of fathoms in depth, were once a part of the continent, and probably were connected with both Asia and Africa, but it is equally clear that the peculiarity of the fauna indicates long isolation, probably since Pliocene, if not from Miocene times.

In conclusion, whilst it is easy to point out omissions, it is only justice to say that in the publication of the present volume a difficult undertaking has been brought to a successful conclusion, and that all concerned in the production of the work deserve congratulation for having contributed so important an addition to zoological science. The present volume is much more nearly complete than most works of its kind, and has been brought out with praiseworthy despatch.

Of the two accompanying illustrations taken from Dr. Forbes's narrative of the journey, one affords an idea of the characteristic scenery in the Archæan Sokotran hills, and the other is an example of the peculiar vegetation of the island. W. T. B.

THE FOOD AND DRUGS ACTS.¹

THE consideration of the circumstances which occasioned the epidemic of arsenical poisoning in the latter part of 1900, arising from the consumption of beer brewed from materials which were subsequently proved to contain large quantities of arsenic, and of the facts which resulted from their inquiry into the conditions under which other articles of food are actually prepared on a manufacturing scale, has led the Commissioners to direct attention to the extremely limited official control possessed by local authorities who are charged with the administration of the Acts

relating to public health and the sale of food over the operations of manufacturers. The Commissioners point out that the existing machinery of public health administration provides little, if any, system of official control over the proceedings of manufacturers of food or of food ingredients. An individual or a company may start the manufacture of some new composition of food, to be sold under a "fancy" name, but there is no obligation to satisfy the local or any other public authority that the composition or the ingredients are wholesome, or that the conditions of preparation preclude the possibility of contamination by deleterious substances. The sanitary authorities of certain districts have obtained powers, under local Acts, to supervise the conditions of manufacture of ice-cream, but the principle is of extremely limited application in effect, and, broadly speaking, the control which can be exercised becomes available only after the food is on sale to the public. But even then the power possessed by the local authority under the Sale of Food and Drugs Acts is extremely circumscribed. Section 3 of the 1875 Act was drawn with the object of preventing adulteration of food with substances injurious to health, but it is so worded that it is almost impossible to obtain convictions under it, and as a consequence local authorities seldom proceed under it. A notable illustration of the impotence of the section was seen in the cases of prosecutions against publicans for selling arsenicated beer, where the proceedings were almost invariably laid under Section 6. Most persons are agreed that arsenic is a deleterious substance, but it was much easier to convict the publican of selling beer to the prejudice of the purchaser which was not of the nature, substance, or quality demanded than of selling beer containing a poisonous ingredient, to wit, arsenic. The irony of the situation is accentuated by the fact that whereas the fines under Section 3 have some relation to the gravity of the offence, and are sufficiently large to be deterrent, under Section 6, which was aimed at an entirely different class, they may be, and frequently are, wholly trivial.

Another illustration of the inadequacy of the section is seen in the case of "preservatives" in food. A departmental committee appointed by the Local Government Board has reported that in its opinion certain "preservatives" are noxious and deleterious, and has recommended their prohibition in articles of food. The Local Government Board has, as yet, done nothing with the report, but various local authorities, finding their hands strengthened by the body of evidence which the committee accumulated, have been emboldened to take steps to check the widespread use of such substances as boracic acid and formalin in connection with milk, but their action is seldom, if ever, brought under the section which imposes a stringent penalty on any person "who mixes . . . any article of food with any ingredient or so as to render the article injurious to health with intent that the same may be sold in that state," but under the section which affords a chance of the magistrate saying that milk *plus* preservative contains more than the purchaser bargained for, and was therefore not of the nature, substance, and quality demanded.

The difficulty, of course, in Section 3 is to prove knowledge and "intent" on the part of the seller, but there is very little doubt that if convictions could be more readily gained under Section 3 the use of preservatives would receive a much needed check.

A public department may, however, be spurred into activity when its interests are jeopardised, and here again beer supplies us with a notable illustration. Beer, as we all know, furnishes much of the revenue of this country, and anything which affects the interests of beer may *pro tanto* be held to affect the

¹ See the article in last week's NATURE, p. 179. The papers referred to are (1) Final Report of the Royal Commission appointed to inquire into Arsenical Poisoning from the Consumption of Beer and other Articles of Food or Drink. (Parliamentary Paper. Cd. 1848. 1903.) (2) Final Report of the Departmental Committee appointed to inquire and report upon the desirability of Regulations under Section 4 of the Sale of Food and Drugs Act 1893 for Butter. (Parliamentary Paper. Cd. 1749. 1903.)

interests of the Revenue. Accordingly the Revenue authorities look pretty sharply after the brewers, and exercise considerable powers with regard to the ingredients which may be used by them. By the Customs and Revenue Act of 1888 the Commissioners of the Treasury have power to prohibit, by issue of an order published in the *London Gazette*, the use in the manufacture or preparation for sale of any article of excise, of any "substance or liquor of a noxious or detrimental nature," or which, "being a chemical or artificial extract or product, may affect prejudicially the interests of the Revenue," and it was in terms of this Act that the Commissioners of the Treasury, acting under the advice of the Commissioners of Inland Revenue, prohibited in 1901 the use of arsenicated glucose and "invert" sugar in the manufacture of beer under a penalty of 50*l*. To the plain man there is an element of humour—grim humour, it must be admitted—about this procedure. Apparently such is the condition of the Statute Book with respect to official control in the interests of public health of the manufacture of articles of food and drink that this is the only known administrative method of arresting a grave public danger—unless, indeed, the incriminated material is of such a character that it may be taken in transit, and that the whole of it may be brought before a magistrate in a police court by direction of a medical officer of health. The action of the Treasury is, it will be observed, restricted to articles of excise, and is exercised ostensibly solely in the interests of the Revenue. No action was, or apparently could be, taken by the local authority in the district in which the works of Bostock and Co. were situated to seize or otherwise deal with the large quantity of contaminated glucose, "invert" sugar, and table syrup stored at these works after their poisonous nature was discovered.

Apart from the injunctions they have laid upon the excise authorities to extend the application of the powers they already possess to ensure the purity of beer, the chief outcome of the Commissioners' protracted inquiry has been to formulate a series of recommendations, or rather propositions, as to the necessity for more extended administration by the Local Government Board; as to the necessity for official "standards" for purposes of the Sale of Food and Drugs Acts; as to the responsibility of the manufacturer or intermediate vendor—that is, apart from the retailer—under the Sale of Food and Drugs Acts; and as to the extension of the powers of local authorities to prevent the sale of suspected foods pending analysis.

With respect to the Local Government Board, the Commissioners are of opinion that this department ought to have the services of a special officer with scientific knowledge, who should be in relation with the Government Laboratory, and be able to institute the necessary chemical inquiries, and in other ways (for instance, where physiological investigations are necessary) have adequate assistance. In this way the Commissioners think that full and authoritative investigation could be made where risks to health are suspected, or where new colouring matters, preservatives, or other chemical additions to food are introduced. The officer ought not only to have the duty of collecting information from public analysts and other local officers, and of advising how the Sale of Food and Drugs Acts may be efficiently worked, but he should be required to make inspections and inquiries as to conditions of food-manufacture at home and abroad. Under the improved condition thus contemplated, the Local Government Board should for such purposes be in touch with other public departments which might

be able to render assistance in special directions, e.g. the Board of Inland Revenue in the case of excisable articles, the Board of Customs in the case of imported foods, and the Patent Office in the case of patented processes of food preparation.

The Commissioners are of opinion that the Local Government Board should be the authority to prescribe and from time to time vary "standards" for the purpose of the Sale of Food and Drugs Acts. By the Act of 1899 the Board of Agriculture has been empowered to make regulations, which may imply "standards," with respect to milk, cream, butter, or cheese, articles which—and especially the first-named—are more frequently the subject of prosecutions under the Acts than any other food substances. There is a slight difference of opinion as to the manner in which these "standards" should be arrived at. The majority of the Commissioners favour the establishment of a so-called Board of Reference, which they define to be a permanent body consisting of a small number of scientific men nominated by the Crown or departmentally. The principal of the Government Laboratory, who, apparently, does not dissent from the idea of a consultative board to advise on points connected with the Sale of Food and Drugs Acts, thinks that it would be preferable to follow the procedure of the Board of Agriculture and to entrust the consideration of the propriety of fixing a standard, or standards in the case of particular groups of allied substances, to specially constituted committees, appointed *ad hoc* and for the occasion, in which manufacturers and technical experts were represented. There is, no doubt, much to be said on both sides of this question, but considering the very large and legitimate commercial interests involved, it is questionable whether public opinion would be wholly satisfied by the exclusion from the board of persons of special knowledge and experience of the article for which a "standard" is required.

After all, the number of substances, or groups of allied substances, for which "standards" would be required is not inordinately large.

A matter of more immediate importance is the nature of the amendment which is required to bring home to the real offender the responsibility for a contravention of the Acts. At present the actual manufacturer of an adulterated article is too frequently allowed to escape, and owing to the difficulty of reaching him, local authorities are often unwilling to take action, on the ground that they do not regard the retailer, who has had nothing to do with the contamination and is frequently not in a position to know that it exists, as the really culpable person. Warranties are very difficult to take action upon, and the conditions which have to be complied with under the Statutes are so numerous and so exacting that it is well nigh hopeless to proceed. If a warrantor states that at the time of giving a warranty "he had reason to believe that the statements contained therein were true," he has a good defence. As the law stands at present it is rarely worth while to attach the manufacturer or middleman to the prosecution.

The particular method of arriving at a food-standard advocated by Dr. Thorpe is well exemplified by the second of the two Parliamentary papers under review. In July, 1901, the departments concerned appointed a committee to inquire and report as to what regulations, if any, may with advantage be made under Section 4 of the Sale of Food and Drugs Act 1899 for determining what deficiency in any of the normal constituents of butter, or what addition of extraneous matter or proportion of water in any sample of butter shall for the purposes of the Sale of Food and Drugs Acts raise

a presumption that the butter is not genuine. In its first report the committee, which was a large and representative one, consisting of analysts, producers, vendors, and public officials connected with the English and Irish Boards of Agriculture, under the chairmanship of Sir Horace Plunkett, after hearing evidence in this country and in Ireland, unanimously recommended the adoption of a limit of 16 per cent. for the proportion of water, and this recommendation was promptly given effect to in the Sale of Butter Regulations 1902.

In the present report the committee deals with the other matters referred to it. These questions have led it to inquire into the chemical nature of butter, to ascertain how far the composition of butter-fat is dependent upon conditions of production and within what limits it may vary. It has also had to inquire into the nature of the substances which may be used for the purpose of adulterating butter, and what methods are open to analysts to detect and determine the extent of such adulteration.

The space at our disposal precludes any attempt to deal in detail with the many interesting points connected with the chemical nature of butter which have come out in the course of the inquiry. Observation has shown that the chemical constitution of butter-fat is dependent to a certain extent upon climatic conditions, period of lactation, nature and amount of food, breed and idiosyncrasy of the cow. The extent to which its composition may vary from these several causes is shown in the evidence which was taken, and which is summarised in the report.

The majority—one member, a butter vendor, alone dissenting—were of opinion that for the purposes of the Sale of Food and Drugs Act 1899 it was expedient to recommend a limit or "standard" based on a deficiency in the normal constituents of butter, and that it was desirable that the limit should have regard to what all authorities are agreed are the characteristic constituents of butter-fat, namely, the volatile acids, which by general consent is by far the most important criterion in butter analysis. They recommend, therefore, that if the amount of the volatile acids in any sample of butter, as determined by the Reichert-Wollny method—a description of which is appended in a schedule to the report—should fall below the number 24, a presumption should be raised that the butter is not genuine. Two members of the committee are disposed to place the limit at 23.

The committee is strongly impressed with the necessity of taking such steps as would directly identify margarine if present in butter, and with this view it recommends that all margarine made or imported into this country should be "ear-marked," as is done in Germany, Austria, and Belgium, and as it is proposed should be done in France, by the addition of 10 per cent. of sesamé oil during its manufacture.

It further suggests that steps should be taken to give effect to the recommendations of the Dairy Congress held at Brussels on April 27 and 28, 1902, to secure international agreement on the subject of control of the manufacture of butter and margarine. In a large number of the countries producing butter for sale in this country a system of control more or less well organised and under State authority already exists, and there ought to be little difficulty in securing by international cooperation and agreement that the system should be uniform and effective.

It remains to be seen what the Minister of Agriculture will do with a report which is particularly interesting as a contribution to the literature of a subject of great importance to the community, and is evidently the carefully digested result of an exhaustive and complicated inquiry.

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THE JANUARY METEORS.

THESE meteors shoot from a point at about $230^{\circ} + 53^{\circ}$ in Bode's modern constellation Quadrans Muralis, placed in the barren region between Boötes, Draco, and Hercules. But the former constellation has never been generally recognised and admitted into recent star-maps. The name "Boötids" has, in fact, been sometimes suggested as preferable to "Quadrantids" for this new-year meteor-shower.

In 1904 the meteors will probably return in their greatest abundance on the nights following January 3 and 4, but the moon will unfortunately be full, and only the brighter members of the shower will be visible. But watches of the sky should be maintained on the early evenings of January 3 and 4, and also on the mornings of those dates (between about 5 and 7 a.m.) if the weather is sufficiently clear. A few large meteors are sure to be visible, notwithstanding the strong moonlight. In some years, when all the conditions are favourable, the display of January meteors is as plentiful as that observed during an average Perseid shower. The really active period of the Quadrantids (or Boötids) is usually very brief, being confined to a few hours. Meteors in the front of the stream begin to appear on about December 28, and the display seems practically exhausted on January 5 or 6. The radiant has a very low northerly position during the greater part of the night, and the meteors exhibit long flights and moderately swift motions.

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NOTES.

M. ALPHONSE ROBERT, the energetic natural history collector who accompanied Dr. Forsyth Major some years ago in his expedition to Madagascar, and who only returned to England a few months ago from a three years' sojourn in Brazil, has just started on another collecting trip to the latter country, where his first destination is Para. The expenses of both the previous and the present expedition, which are undertaken in the interests of the British Museum, are borne by Mrs. Percy Sladen. M. Robert, we understand, intends to spend some time collecting at Para, and thence to ascend the Amazons into Peruvian territory. The specimens collected by M. Robert during his last trip have done much to increase our knowledge of the mammalian fauna of the Matto Grosso and adjacent districts of Brazil, and the novelties obtained have been from time to time recorded by Mr. O. Thomas in the *Annals of Natural History*. Among these are several new bats (one indicating a new generic type), a squirrel, and a new race of the crab-eating fox (*Canis thous angulensis*). M. Robert has also obtained a fine series of skins of the large and handsome brown woolly spider-monkey (*Brachyteles arachnoides*), a pair of which are now being set up by Mr. Rowland Ward for the British (Natural History) Museum.

THE report submitted at the second annual meeting of the trustees of the Carnegie Institution, held in Washington recently, shows that sixty-six grants were made by the executive committee for scientific research, amounting to an aggregate sum of 30,000*l.*, the recipients of which represent every part of the United States and the smaller colleges as well as the large universities, observatories and laboratories. Twenty-five research assistants were appointed. These sums are exclusive of administrative and incidental expenses of the Institution. Arrangements have been made for publication at an early day of eleven scientific papers,